

Press Release 05/2017

Barometric MEMS Pressure Sensor

Chemically resistant MEMS pressure sensors for bio and medical technology
Plasma etching technology opens up new geometries for MEMS sensors

CiS Research Institute for Microsensor Systems will present extremely stable, media-resistant barometric pressure sensors in MEMS technology. As a research institute, CiS offers technological solutions to industrial customers and supports the transfer from functional design to serial production in accordance with ISO9001 certification.

The outstanding long-term stability, the high reliability and measuring accuracy as well as the chemical resistance of the media-contacting surfaces are the hallmarks of the new MEMS pressure sensors of CiS. Without protective buffer or seal in the form of oils or elastomeric layers, the sensor elements produced in a plasma depth etching process are directly usable, e.g. in medical applications or in micro-reactors in biotechnology.

The absolute pressure sensors presented here with an edge length of 1 mm and embedded piezoresistors typically provide 20 μV / hPa sensitivity with measuring accuracies of up to 0.001 hPa. Due to the high resolution, the sensors are suitable for navigation in indoor areas or for monitoring tasks, such as the fall detection of patients.

With the plasma depth etching process, shapes of cavities and chip contours can be realized, which are not possible with wet etching processes. Even round cavities and sensor chips are possible for special applications. The structure of the functional sensor element is achieved by wafer-level packaging (WLP), whereby, for 3D integration, flip-chip connections and silicon vias (through silicon VIAs - TSVs) are used. In case of corresponding quantities, the production costs are by all means comparable to those of conventional technologies.

Further projects are already being planned on the basis of the developed production technology. This includes the connection of the WLP sensor modules to conductor tracks of ceramic substrates with glass solder, the realization of multi-chip modules and the development of high-temperature piezoresistors, coatings and mounting techniques. The vertical integration of the sensor chips onto customer-specific ASICs is generally done without bonding wires by means of corresponding interposers with through-hole contacts in TSV technology.

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Presentation of technology and prototypes at:

Hanover Fair, 24-28 April 2017, Hanover, hall 4, booth F34

SMT Hybrid Packaging, 16-18 May 2017, Nuremberg, hall 4A, booth 318B

SENSOR+TEST, 30 May - 1 June 2017, Nuremberg, hall 1, booth 1-150

About CiS Forschungsinstitut für Mikrosensorik GmbH

CiS Research Institute for Micro Sensors GmbH is a leading R & D provider in the fields of optical, micromechanical and piezoresistive sensors as well as silicon detectors. It employs more than 100

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employees and supports companies in the development of customized solutions in the fields of sensor and microsystem technology and manufactures these in small batches. Basis is the silicon technology with the specialties: 3D structuring, stacking technologies and double-sided wafer processing.

Press contact:

CiS Forschungsinstitut für Mikrosensorik GmbH, 99099 Erfurt, Germany
Uta Neuhaus | Phone.: +49 361 663 1154 | E-Mail: uneuhaus@cismst.de | www.cismst.de

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Glossar

MEMS: Micro-Electro-Mechanical Systems

MOEMS: Micro-Opto-Electro-Mechanical Systems

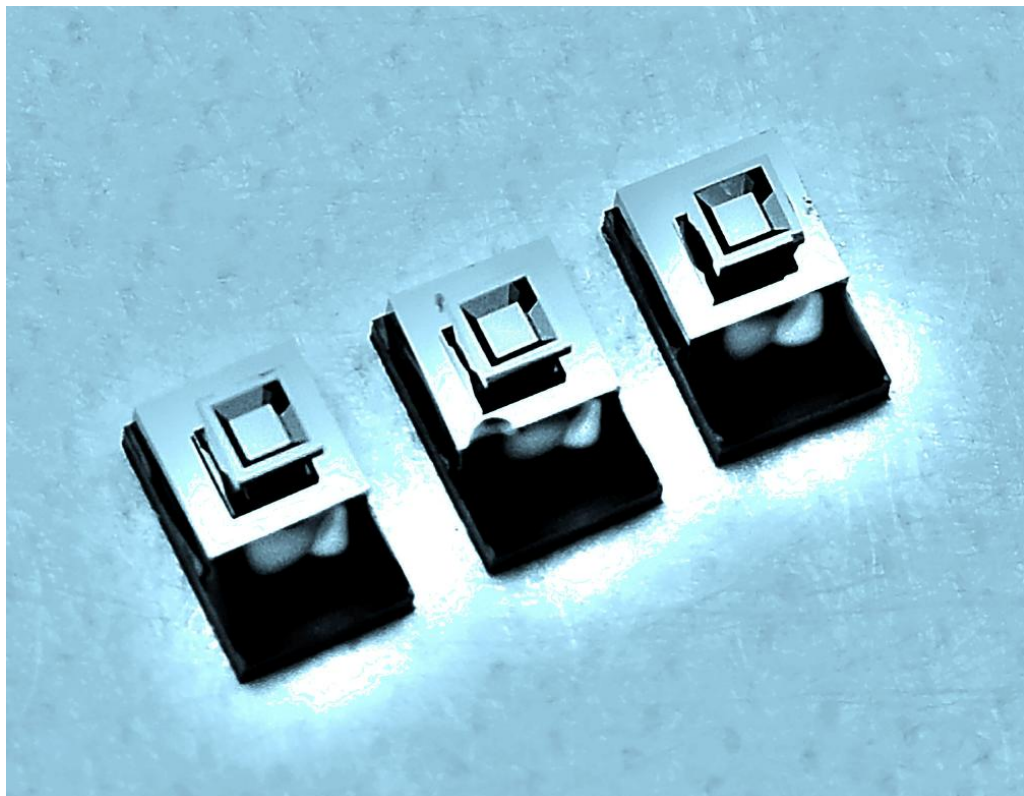
WLP: Waver-Level-Packaging

TSV: Through Silicon VIA

VIA: Vertical Interconnect Access

Interposer: Passive electrical interface for spreading interconnections between different electrical components

Picture:



Barometric MEMS Pressure Sensor – Edge length 1 mm

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